
CHASSIS ELECTRICAL

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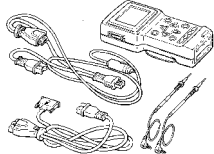
IGNITION SWITCH AND IMMOBILIZER SYSTEM

GENERAL

OUTLINE OF CHANGES

The following service procedures have been added as the immobilizer control has been changed from the ID code type to the encrypted code type.

SPECIAL TOOL

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	<ul style="list-style-type: none"> • Immobilizer system check (Diagnosis display using the MUT-II) • Registration of the encrypted code

TROUBLESHOOTING

Caution

The encrypted code should always be re-registered when replacing the immobilizer-ECU.

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to basic manual.

DIAGNOSIS FUNCTION

DIAGNOSIS CODES CHECK

Refer to basic manual.

ERASING DIAGNOSIS CODES

Refer to basic manual.

Caution

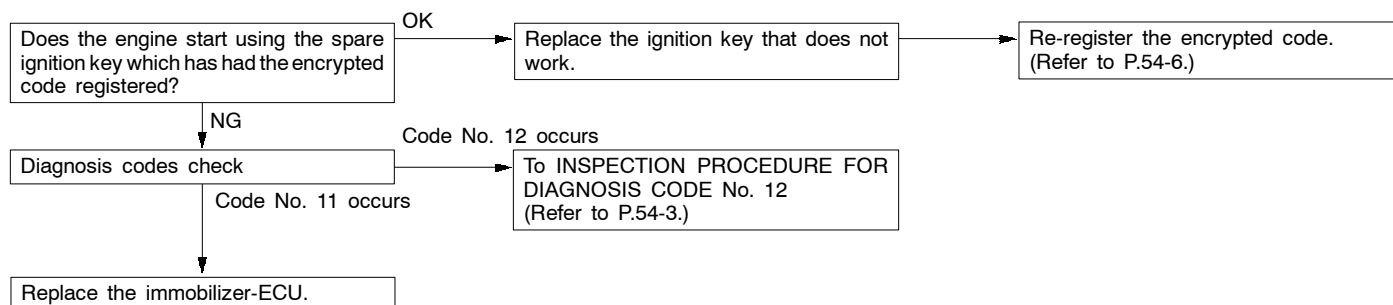
The diagnosis codes which result from disconnecting the battery cables cannot be erased.

INSPECTION CHART FOR DIAGNOSIS CODES

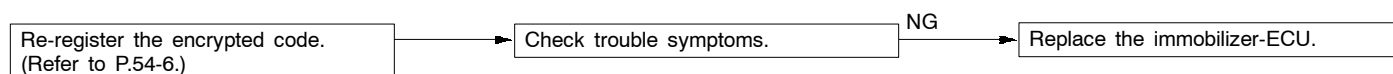
Diagnosis code No.	Inspection items	Reference page
11	Transponder communication system	54-3
12	Encrypted code are not the same or are not registered	54-3

INSPECTION PROCEDURE FOR DIAGNOSIS CODES

Code No. 11 Transponder communication system	Probable cause
The encrypted code of the transponder is not sent to the immobilizer-ECU immediately after the ignition switch is turned to the ON position.	<ul style="list-style-type: none"> • Malfunction of the transponder • Malfunction of the ignition key ring antenna • Malfunction of the immobilizer-ECU



Code No. 12 Encrypted code are not the same or are not registered	Probable cause
The encrypted code which is sent from the transponder is not the same as the encrypted code which is registered in the immobilizer-ECU.	<ul style="list-style-type: none"> • The encrypted code in the ignition key being used has not been properly registered. • Malfunction of the immobilizer-ECU



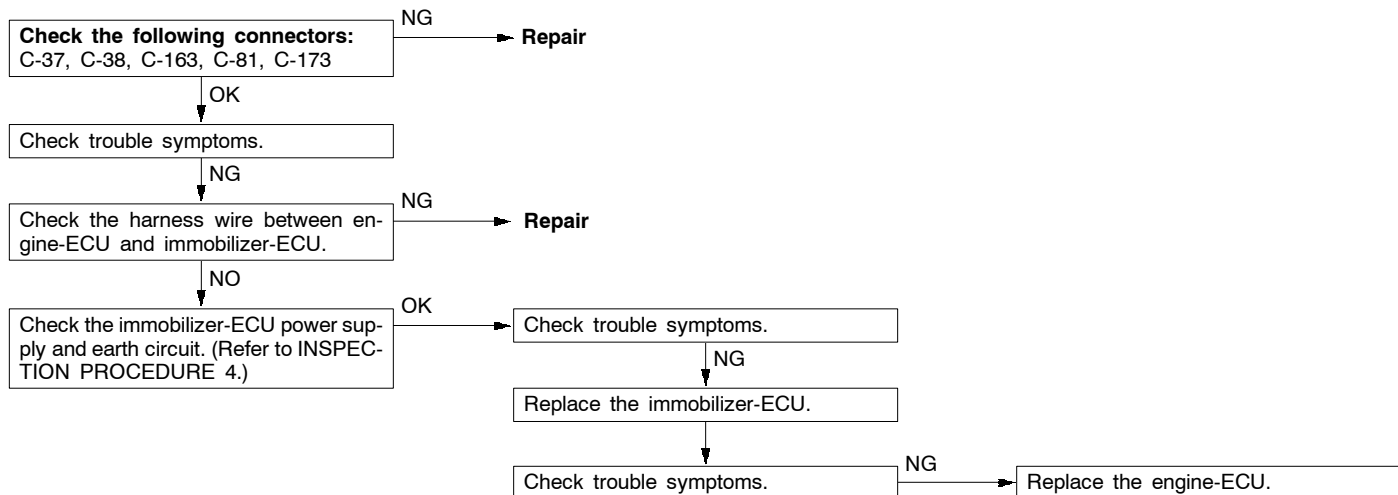
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Reference page
Communication with MUT-II is impossible.	—	GROUP 13A – Troubleshooting
Diagnosis code No. 54 has been generated by the engine-ECU.	1	54-4
Encrypted code cannot be registered using the MUT-II.	2	54-4
Engine does not start (Cranking but no initial combustion).	3	54-5
Malfunction of the immobilizer-ECU power supply and earth circuit	4	54-5

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

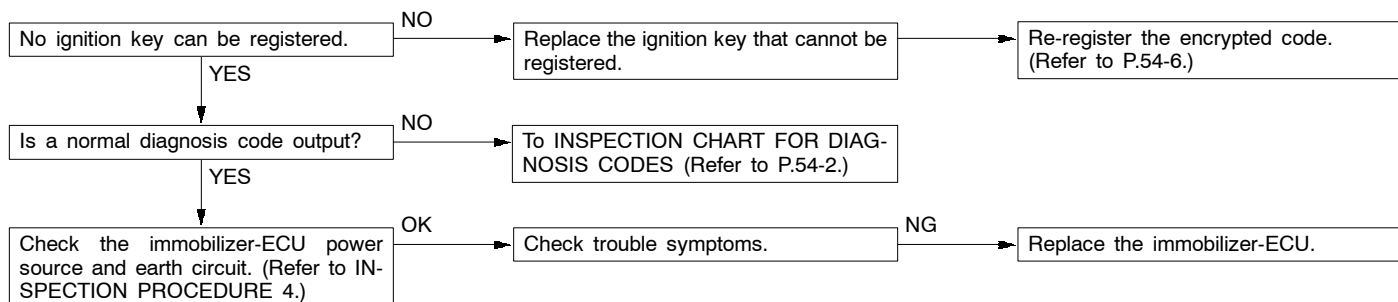
Inspection Procedure 1

Diagnosis code No. 54 has been generated by the engine-ECU.	Probable cause
There is a problem with communication between the engine-ECU and the immobilizer-ECU.	<ul style="list-style-type: none"> • Malfunction of harness or connector • Malfunction of the immobilizer-ECU • Malfunction of the engine-ECU



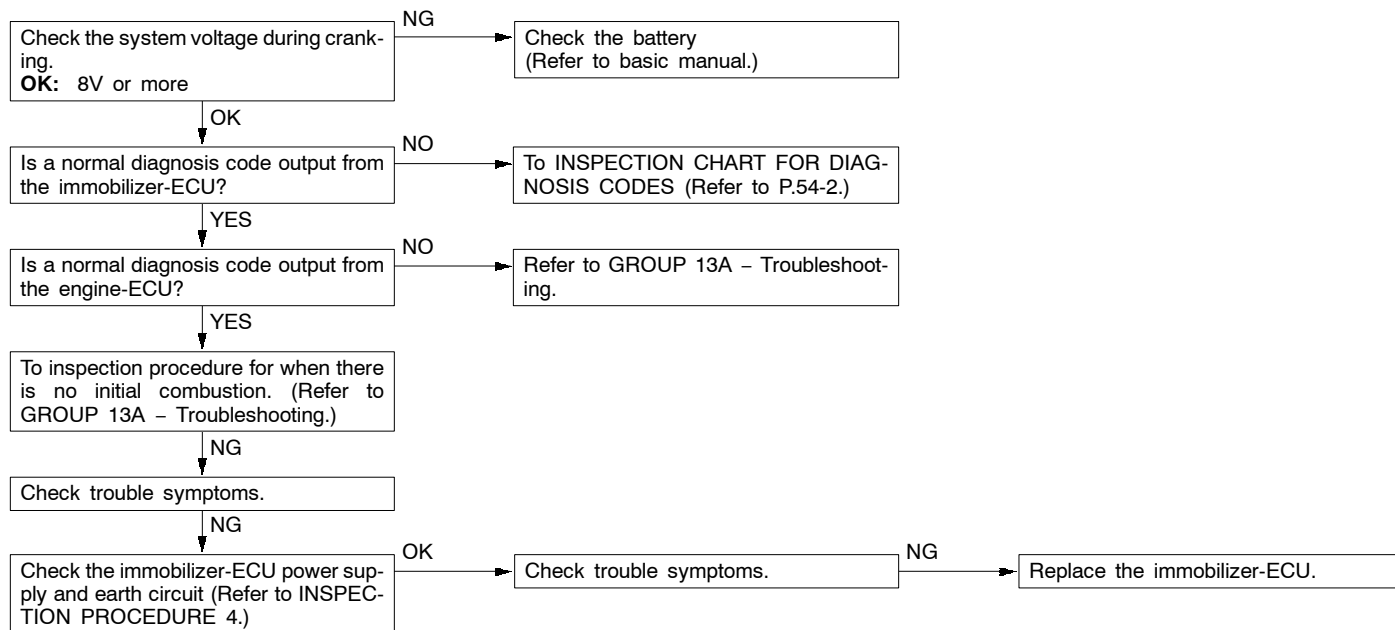
Inspection Procedure 2

Encrypted code cannot be registered using the MUT-II.	Probable cause
The cause is probably that there is no encrypted code registered in the immobilizer-ECU, or there is a malfunction of the immobilizer-ECU.	<ul style="list-style-type: none"> • Malfunction of the transponder • Malfunction of the ignition key ring antenna • Malfunction of harness or connector • Malfunction of the immobilizer-ECU



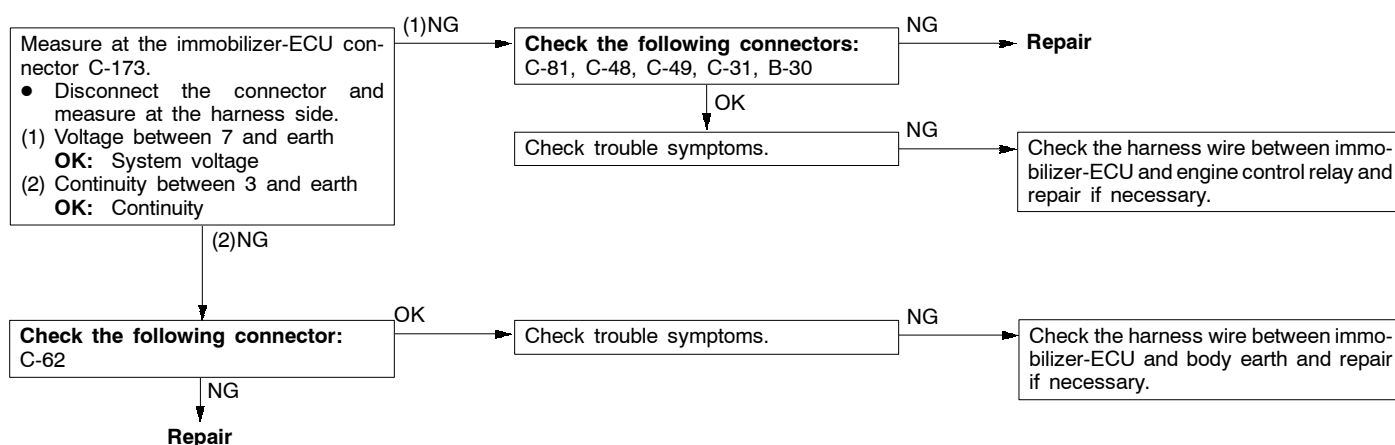
Inspection Procedure 3

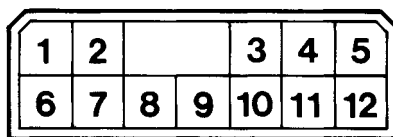
Engine does not start (cranking but no initial combustion).	Probable cause
If the fuel injectors are not operating, there might be a problem with the GDI system in addition to a malfunction of the immobilizer system. It is normal for this to occur if an attempt is made to start the engine using a key that has not been properly registered.	<ul style="list-style-type: none"> Malfunction of the GDI system Malfunction of the immobilizer-ECU



Inspection Procedure 4

Malfunction of the immobilizer-ECU power supply and earth circuit



CHECK AT IMMOBILIZER-ECU**TERMINAL VOLTAGE CHECK CHART**

1610641

Terminal No.	Signal	Checking requirements	Terminal voltage
1, 2	—	—	—
3	Immobilizer-ECU earth	Always	0 V
4	—	—	—
5	Engine-ECU	—	—
6	—	—	—
7	Immobilizer-ECU power supply	Ignition switch: ON	System voltage
8, 9	—	—	—
10	Ignition key ring antenna	—	—
11	Ignition key ring antenna	—	—
12	—	—	—

IGNITION SWITCH AND IMMOBILIZER SYSTEM**ENCRYPTED CODE REGISTRATION METHOD AND RESETTING THE CODE TO THE FACTORY SETTING**

Register the encrypted code in the immobilizer-ECU and then reset the code to the factory setting after parts have been replaced.

Replacement part	Encrypted code
Ignition key	Necessary
Ignition key ring antenna and immobilizer-ECU	Necessary
Engine-ECU*	Necessary

NOTE

*: If the engine-ECU is replaced, the ignition key ring antenna and immobilizer-ECU and ignition key should be replaced together with it.

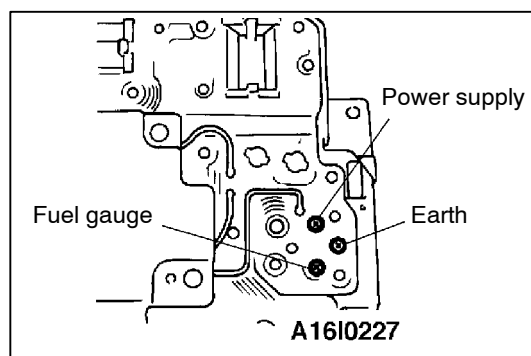
Each engine-ECU has an individual information for immobilizer-ECU, and the individual information is registered in the immobilizer-ECU.

COMBINATION METERS

GENERAL

OUTLINE OF CHANGES

The following service procedures have been added to correspond to the introduction of the high-contrast meter.



COMBINATION METERS

INSPECTION

FUEL GAUGE RESISTANCE CHECK

1. Remove the power supply tightening screw.
2. Use an ohmmeter to measure the resistance value between the terminals.

Standard value:

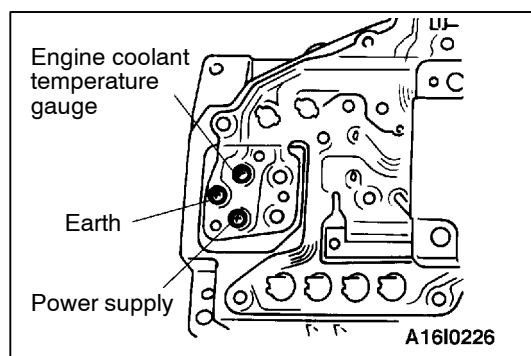
Power supply – Earth: 97.5 Ω

Power supply – Fuel gauge: 54.5 Ω

Fuel gauge – Ground: 93.5 Ω

Caution

When inserting the testing probe into the power supply terminal, be careful not to touch the printed board.



ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE CHECK

1. Remove the power supply tightening screw.
2. Use an ohmmeter to measure the resistance value between the terminals.

Standard value:

Power supply – Earth: 97.5 Ω

Power supply – Engine coolant temperature gauge: 54.0 Ω

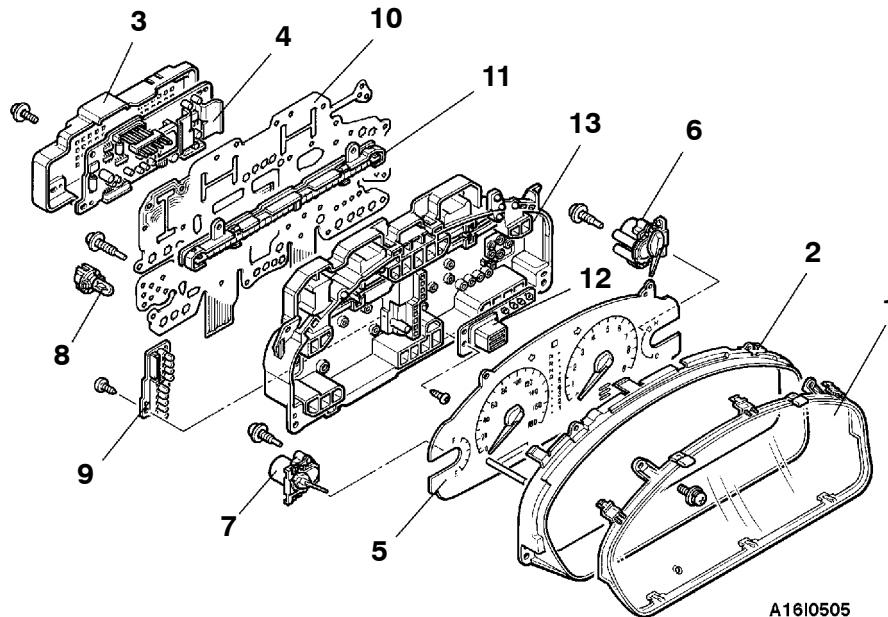
Engine coolant temperature gauge – Earth: 150.8 Ω

Caution

When inserting the testing probe into the power supply terminal, be careful not to touch the printed board.

COMBINATION METERS

DISASSEMBLY AND REASSEMBLY

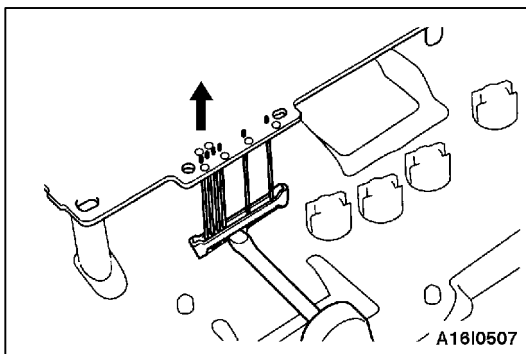
**Disassembly steps**

1. Combination meter glass
2. Combination meter window plate
3. Combination meter case
4. Printed circuit board
5. Combination meter assembly
6. Water temperature gauge
7. Fuel gauge

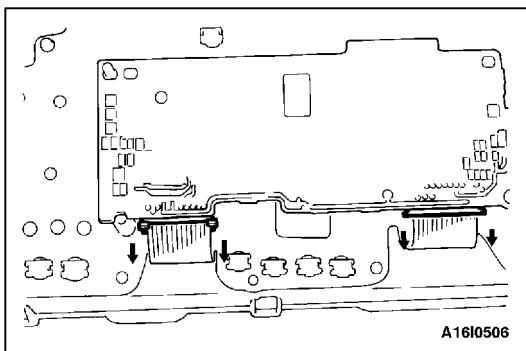
8. Bulb
9. Printed circuit board
10. Printed circuit board
11. Printed circuit board
12. Printed circuit board
13. Combination meter case

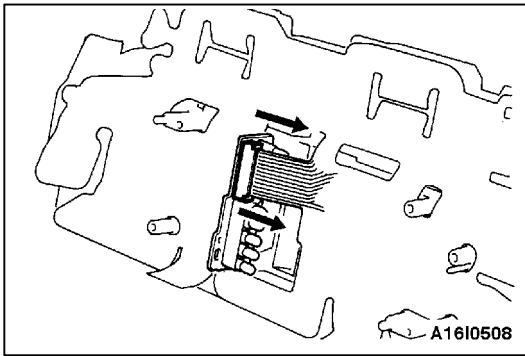
◀A▶

◀B▶

**DISASSEMBLY SERVICE POINTS****◀A▶ PRINTED CIRCUIT BOARD REMOVAL**

1. Wrap the end of a thin flat-tipped screwdriver by plastic tape, and then use it to unlock the connector at the top of the printed circuit board.
2. Unlock the connector at the bottom of the printed circuit board.
3. Remove the printed circuit board.





◀B▶ PRINTED CIRCUIT BOARD REMOVAL

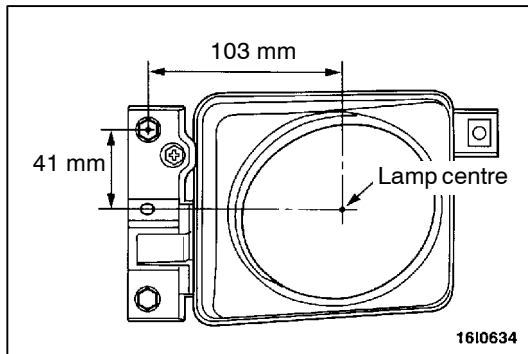
1. Remove the retaining screws, and then withdraw the printed circuit board.
2. Unlock the printed circuit board connector.
3. Remove the printed circuit board.

FRONT FOG LAMP

GENERAL

OUTLINE OF CHANGES

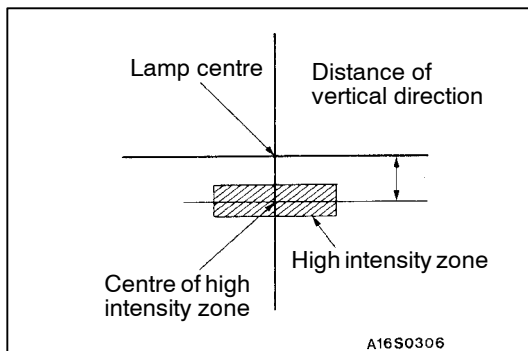
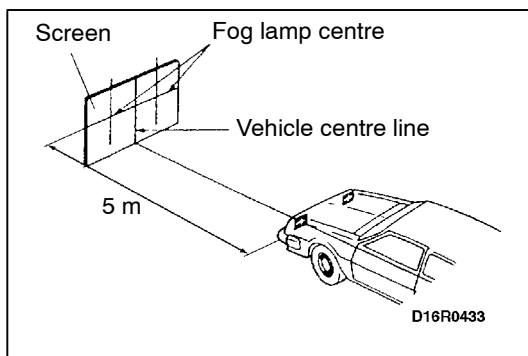
The following service procedures have been changed to the modification on the fog lamp.



ON-VEHICLE SERVICE

FRONT FOG LAMP AIMING

1. Measure the centre of the fog lamps, as shown in the illustration.
2. Set the distance between the screen and the centre of the fog lamps as shown in the illustration.
3. Inflate the tyres to the specified pressures and there should be no other load in the vehicles other than driver or substituted weight of approximately 75 kg placed in the driver's position.
4. With the engine running at 2,000 r/min, aim the fog lamp.



5. Check if the beam shining onto the screen is at the standard value.

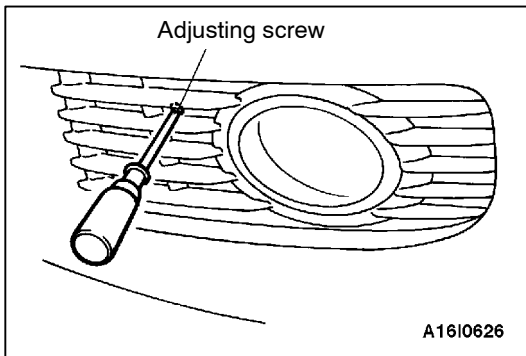
Standard value:

(Vertical direction)

100 mm below horizontal (H)

(Horizontal direction)

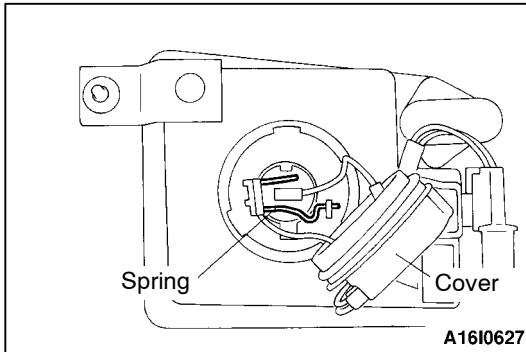
Parallel to direction of vehicle travel

**NOTE**

The horizontal direction is non-adjustable. If the deviation of the light beam axis exceeds the standard value, check to be sure that the mounting location or some other point is not defective.

Caution

When making the aiming adjustment, be sure to mask those lamps which are not being adjusted.

**BULB REPLACEMENT**

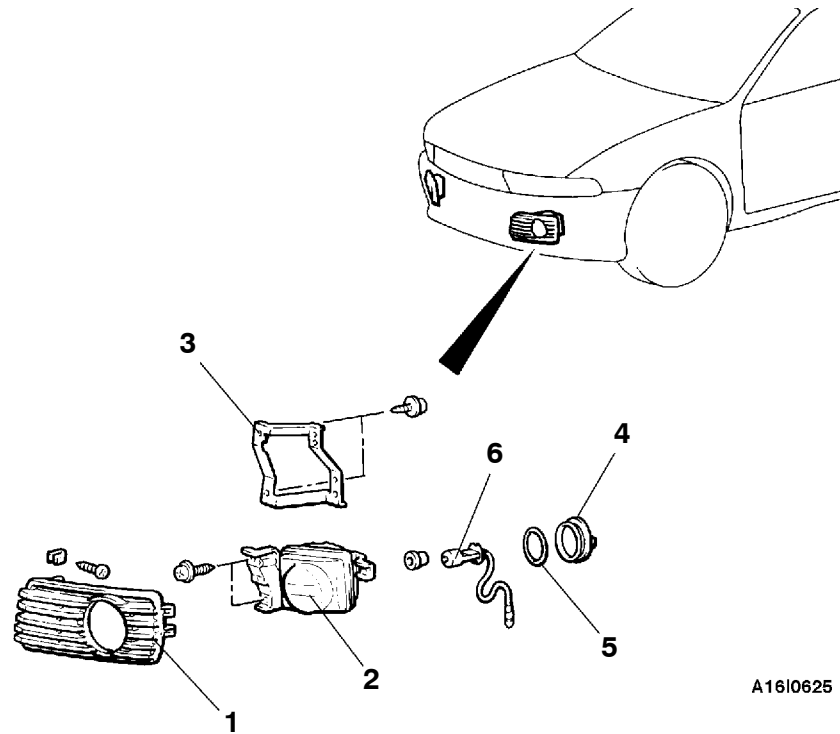
1. Remove the fog lamp bezel.
2. Remove the fog lamp unit.
3. Undo the fog lamp cover.
4. Unhook the spring which secure the bulb and then remove the bulb.

Caution

Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

FRONT FOG LAMP

REMOVAL AND INSTALLATION



Removal steps

1. Fog lamp bezel
2. Fog lamp
3. Fog lamp bracket

4. Cover
5. Packing
6. Fog lamp bulb

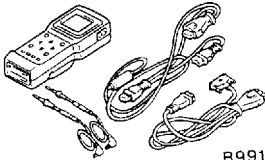
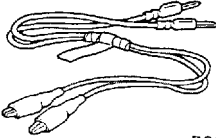
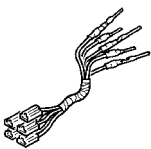
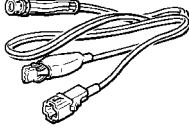


ROOM LAMP

GENERAL

OUTLINE OF CHANGES

The following service procedures have been added as the room lamp dimming function has been added to the ETACS functions.

SPECIAL TOOLS

Tool	Number	Name	Use
 B991502	MB991502	MUT-II sub assembly	ETACS-ECU input check
 B991529	MB991529	Diagnosis code check harness	ETACS-ECU input check
A  B  C  D  C991223	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	ETACS-ECU terminal voltage measurement A: Connector pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

TROUBLESHOOTING

DIAGNOSIS FUNCTION

INPUT SIGNAL INSPECTION PROCEDURE

1. Connect the MUT-II or a voltmeter to the diagnosis connector to check input signal.
2. The following input signals can be checked:
 - Door switch
 - Ignition switch
 - Key reminder switch
 - Keyless entry transmitter (LOCK, UNLOCK)

NOTE

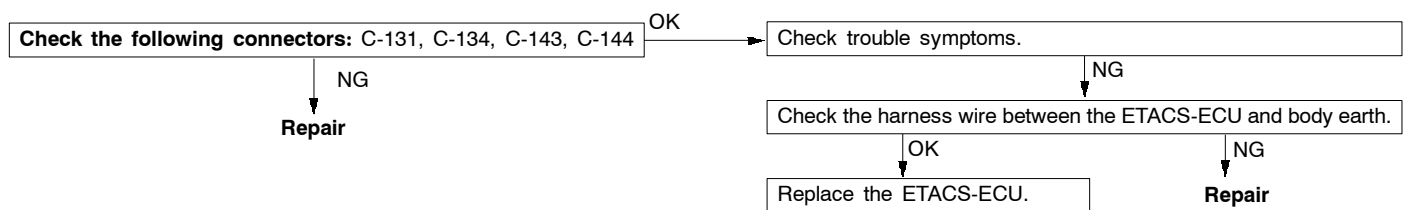
If all the input signals cannot be checked by using the MUT-II, the diagnosis circuit may be defective.

INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptoms	Inspection procedure	Reference page
When all the doors is closed, the room lamp is switched off immediately, but does not fade out.	1	54-13
When a door is opened with the room lamp switch in the DOOR position, the room lamp does not illuminate.	2	54-14
When the ignition switch is turned to the ON position while the room lamp is fading out, the room lamp is not switched off (However, the room lamp will be switched off after fading out).	3	54-14
The room lamp can not be switched off (However, it is switched off when the room lamp switch is set to the OFF position).	4	54-15

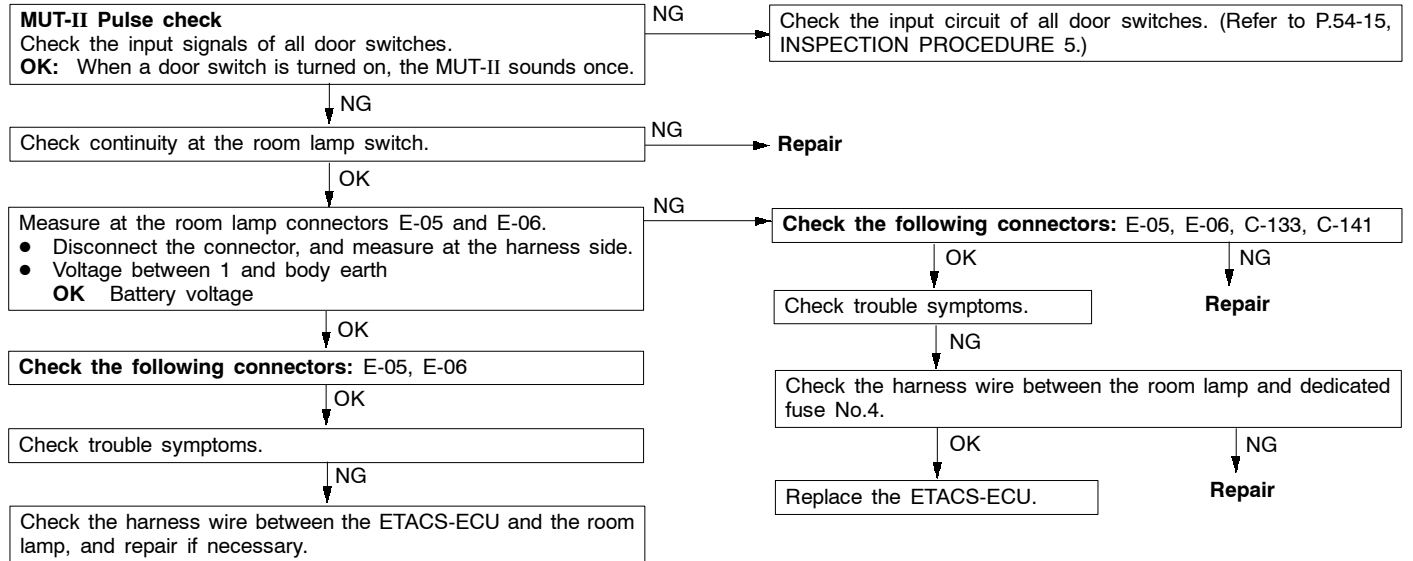
INSPECTION PROCEDURE 1

When all the doors is closed, the room lamp is switched off immediately, but does not fade out.	Probable cause
The harness wire in the earth circuit or the ETACS-ECU can be defective.	<ul style="list-style-type: none"> • Malfunction of harness or connector • Malfunction of ETACS-ECU



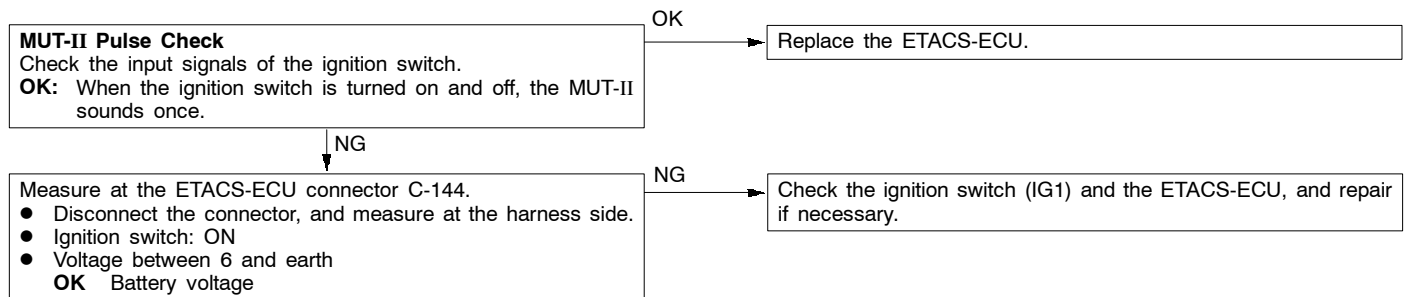
INSPECTION PROCEDURE 2

When a door is opened with the room lamp switch in the DOOR position, the room lamp does not illuminate.	Probable cause
The door switch circuit of all doors or the room lamp illumination circuit can be defective.	<ul style="list-style-type: none"> • Malfunction of room lamp • Malfunction of harness or connector • Malfunction of ETACS-ECU



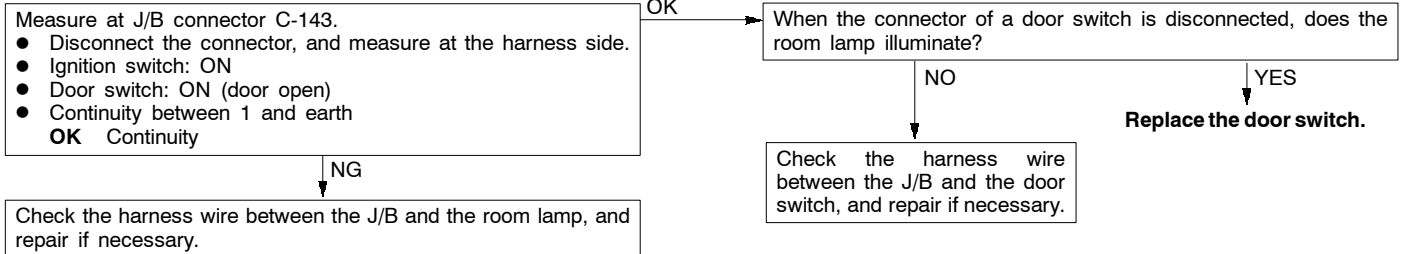
INSPECTION PROCEDURE 3

When the ignition switch is turned to the ON position while the room lamp is fading out, the room lamp is not switched off (However, the room lamp will be switched off after fading out).	Probable cause
The ignition circuit or the ETACS-ECU can be defective. In addition, a defective fuse can cause a malfunction in the indicator lamp in the combination meter or a short in the harness wire.,	<ul style="list-style-type: none"> • Malfunction of fuse • Malfunction of connector • Malfunction of harness • Malfunction of ETACS-ECU

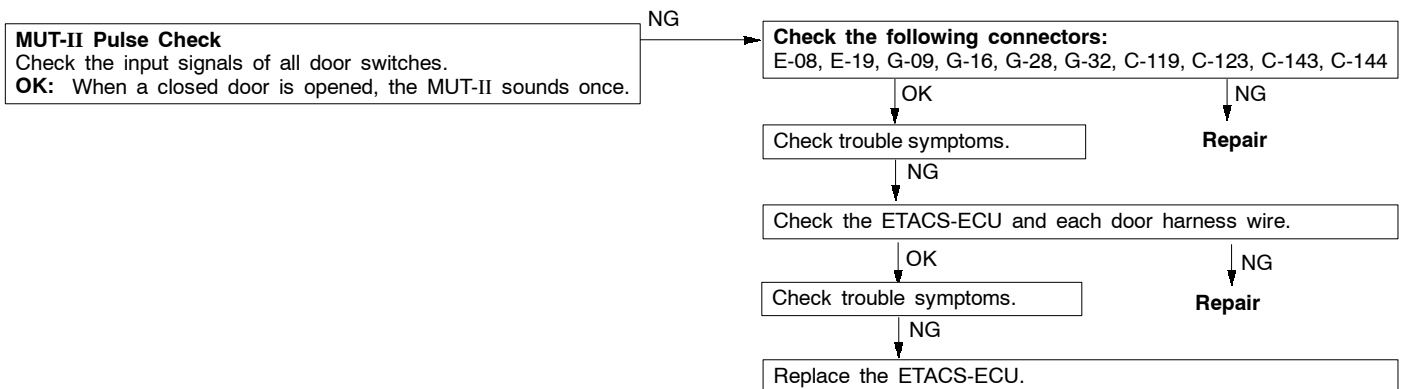


INSPECTION PROCEDURE 4

The room lamp can not be switched off (However, it is switched off when the room lamp switch is set to the OFF position.)	Probable cause
A short in the harness wire can be present, or a door switch can be defective.	<ul style="list-style-type: none"> • Malfunction of door switch • Malfunction of harness



INSPECTION PROCEDURE 5

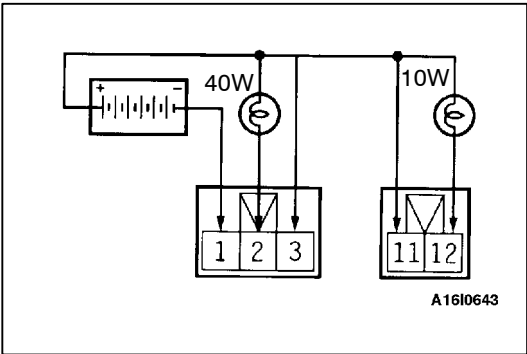
Check the input circuit of all door switches.

RHEOSTAT

GENERAL

OUTLINE OF CHANGES

The following inspection procedure has been added to correspond to the change on the rheostat <Vehicles with high-contrast meter>.



RHEOSTAT

INSPECTION

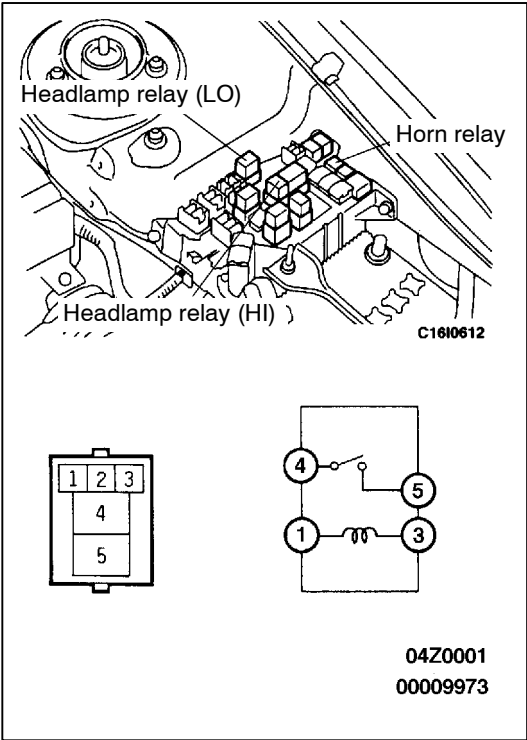
1. Connect the battery and the test bulbs (40W and 10W) as shown in the illustration.
2. Operate the rheostat, and if the brightness changes smoothly without switching off, then the rheostat function is normal.

RELAY

GENERAL

OUTLINE OF CHANGES

The following inspection procedure has been added to correspond to the relocation of the horn relay and the addition of the headlamp relays (LO and HI).



RELAY

INSPECTION

HEADLAMP RELAY (LO), (HI) AND HORN RELAY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Supplied	⊕	⊖	○	○
Not supplied	○	○		